

# Claims

[c1] What is claimed is:

1.A critical dimension (CD) control method for semiconductor fabrication processes, comprising:

providing a substrate;

depositing a semiconductor layer on said substrate;

depositing a cap layer on said semiconductor layer;

forming a photoresist pattern on said cap layer, the photoresist pattern having a top surface and vertical sidewalls;

selectively sputtering a silicon thin film on said top surface and said vertical sidewalls of said photoresist pattern, but substantially not on said cap layer;

using said silicon thin film and said photoresist pattern as etching hard mask, carrying out an anisotropic dry etching to etch said cap layer, thereby transferring said photoresist pattern to said cap layer; and

continuing said anisotropic dry etching, using said patterned cap layer as etching hard mask to etch said semiconductor layer.

[c2] 2.The CD control method for semiconductor fabrication processes according to claim 1 wherein said semicon-

ductor layer comprises a polysilicon layer.

- [c3] 3.The CD control method for semiconductor fabrication processes according to claim 1 wherein said semiconductor layer comprises a silicide layer.
- [c4] 4.The CD control method for semiconductor fabrication processes according to claim 1 wherein said cap layer is made of silicon nitride.
- [c5] 5.The CD control method for semiconductor fabrication processes according to claim 1 wherein thickness of said silicon thin film on said vertical sidewalls is "x", while thickness of said silicon thin film on said top surface is "y", wherein  $x < y$ .
- [c6] 6.The CD control method for semiconductor fabrication processes according to claim 5 wherein  $x < 0$  angstroms.
- [c7] 7.The CD control method for semiconductor fabrication processes according to claim 5 wherein  $x < 0$  angstroms.